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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,221	08/21/2003	Bruce G. Lindsay	ARC920030007US1	7145

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SUITE 304  
ANNAPOLIS, MD 21401

EXAMINER
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LOVEL, KIMBERLY M

ART UNIT	PAPER NUMBER
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2167

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/645,221	LINDSAY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kimberly Lovel	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-52 are rejected.

#### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 November 2006 has been entered.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claim 1** is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The claim recites the limitations "embedding replication tracking information within said delta production and consumption value, wherein said replication tracking information comprises a timestamp and a contiguous sequence number" and "atomically and independently applying updates exactly once at a target site using said replication tracking information." However, in order for the target site to be able to apply the updates using the replication tracking information, the delta production and

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consumption values would have to first be sent to the target site. Therefore, the omitted step is sending the delta production and consumption values, which include replicated tracking information from the source to the target.

**Claims 2-17**, which are dependent on claim 1, fail to overcome the deficiencies of claim 1 and therefore are rejected on the same grounds as claim 1.

4. **Claim 18** recites a program storage device readable by a computer, tangibly embodying a program of instructions executable by said computer to perform a method of data replication. The method disclosed in claim 18 contains the same deficiencies as the method of claim 1.

**Claims 19-34**, which are dependent on claim 18, fail to overcome the deficiencies of claim 18 and therefore are rejected on the same grounds as claim 18.

#### ***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claims 35-52** rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

**Claim 35** recites a data replication system comprising a source site, a target site and a delta production and consumption interface. Even though claim 35 recites a system, the system can comprise entirely of software per se according to one of ordinary skill in the art. Therefore, since the system fails to contain hardware, the system fails to fall

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within one of the statutory categories (Process, Machine, Manufacture, Composition of Matter and Improvements thereof).

According to MPEP 2106:

The claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." Both types of "descriptive material" are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)

Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.").

**Claims 36-51**, which are dependent on the system of claim 35 fail to overcome the deficiencies of claim 35 and therefore are rejected on the same grounds as claim 35.

**Claim 52** recites a data replication system comprising: means for assigning a delta production and consumption value for arbitrary data sources and targets operable for replicating data, wherein each delta production and consumption value contains all changes that must be applied atomically to data being replicated in said data replication system; means for embedding replication tracking information within said delta production and consumption value, wherein said replication tracking information

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comprises origination tags, a timestamp and a contiguous sequence number; means for atomically and independently applying updates exactly once at a target site using said replication tracking information; and means for using an apply service at said target site to embed and analyze said tracking information during a crash recovery sequence, wherein said apply service utilizes an in-memory index when a system crash occurs and a recovery process is initiated by said data replication system.

Even though claim 52 recites a system, the system can comprise entirely of software *per se* according to one of ordinary skill in the art. The limitations of the claims each recite "means for." According to the Applicants' specification, different services represent the "means for." The services are considered to represent software. Therefore, since the system fails to contain hardware, the system fails to fall within one of the statutory categories (Process, Machine, Manufacture, Composition of Matter and Improvements thereof).

According to MPEP 2106:

The claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." Both types of "descriptive material" are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)

Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the

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claims for an algorithm in *Benson* were unpatentable as abstract ideas because “[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.”).

***Allowable Subject Matter***

6. The following is a statement of reasons for the indication of allowable subject matter:

Claims 1-34 are rejected under 35 USC § 112 and claims 35-52 are rejected under 35 USC § 101.

Claims 1-34 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Claims 35-52 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office action.

In the Examiner's Final Office Action dated 21 August 2006, the 35 USC § 102 rejection of claim 52 was based on US Patent No 6,889,231 to Sounder et al; the 35 USC § 103 rejections of claims 1-13, 15-30, 32-47 and 49-51 were based on US Patent No 6,889,231 to Sounder et al and US PGPub 2003/0088589 to Good et al; and the 35 USC § 103 rejections of claims 14, 31 and 48 were based on US Patent No 6,889,231 to Sounder et al; US PGPub 2003/0088589 to Good et al; and US Patent No. 6,006,267 to Nguyen et al. In the Remarks filed on 19 October 2006, Applicant specifically emphasized that Sounder uses a different connotation of the term atomic than defined by the Applicants Specification. The Applicants' use of "atomically" is that each update is applied only once. Also the Remarks state that the Applicants' embed tracking information within the update itself. In contrast, Sounder sends the replication

information as part of the same stream, but not as part of the update. Therefore, Sounder does not embed such replication tracking information within the update.

The Request for Continued Examination filed 9 November 2006, further narrowed and clarified the subject matter in each of the independent claims. The combination of the limitations as a whole within the amended independent claims overcome the prior art and therefore are considered allowable subject matter.

An updated search of prior arts on EAST database and on domains (NPL-ACM, Google, NPL-IEEE) have been conducted. The prior arts searched and investigated in the database and domains does not fairly teach or suggest the teaching of the newly amended claimed subject matter as described above and reflected by the combined elements in the independent claims 1, 18, 35 and 52.

The dependent claims 2-17, 19-34 and 36-51 depending directly or indirectly upon claims 1, 18 and 35, respectively, are also distinct from the prior art for the same reasons.

7. As allowable subject matter has been indicated, applicants' reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).



**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly Lovel whose telephone number is (571) 272-2750. The examiner can normally be reached on 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kimberly Lovel  
Examiner  
Art Unit 2167

19 February 2007  
kml

*Kue S. Lu PSA Examiner, art unit 2167*